



Date \_\_\_\_\_ Page \_\_\_\_\_ of \_\_\_\_\_

Project Manhattan Addition

Item Drainage Plan

Manhattan Addition is a plat at the NE corner of 21<sup>st</sup> and Greenwich Rd. The plat contains approximately 20 acres and will be developed as a commercial property.

Existing drainage from the site is concentrated near the 21<sup>st</sup> St. & Greenwich Rd. intersection and discharged under Greenwich in a 36" x 24" CMAP. This culvert pipe will be replaced by (3) 30"  $\phi$  RCP's to handle the developed conditions runoff.

Using a "pre-developed" CN of 81 and a "developed" CN of 93, the peak 100-year runoff for pre-developed conditions is 108 cfs, and 128 cfs for "developed" conditions. (See following HEC-1 Run.) Because the difference in peak Q's is small, the new pipes were sized assuming no detention storage is provided on the developed site.

```

1*****
*
* FLOOD HYDROGRAPH PACKAGE (HEC-1)
*   MAY 1991
*   VERSION 4.0.1E
*   Lahey F77L-EM/32 version 5.01
*   Dodson & Associates, Inc.
*   RUN DATE 01/02/96 TIME 08:39:24
*****
    
```

```

*****
*
* U.S. ARMY CORPS OF ENGINEERS
* HYDROLOGIC ENGINEERING CENTER
* 609 SECOND STREET
* DAVIS, CALIFORNIA 95616
* (916) 551-1748
*****
    
```

```

X X XXXXXXX XXXX X
X X X X X XX
X X X X X X
XXXXXX XXXX X XXXX X
X X X X X X
X X X X X X
X X XXXXXXX XXXX XXX
    
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE. THE DEFINITION OF -AMSK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE, SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY, DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

1

HEC-1 INPUT

PAGE 1

```

LINE ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
1 ID MANHATTAN ADDITION DRAINAGE PLAN
2 ID REQ'D POND SIZE ABOVE 35" X 24" CMAP UNDER GREENWICH
3 ID 5-, 10-, 25-, & 100-Year Storms
4 ID Professional Engineering Consultants
5 ID Wichita, Ks
6 ID DRC 11/20/95
7 ID File: T:\DAR\HEC1\MNHATTAN.IH1
8 IT 6 01FEB95 0600 0 02FEB95 1154
9 IN 30 01FEB95 0600
10 IO 3 0
11 JR PREC 0.5902 0.6875 0.8125 1.000
*
*DIAGRAM
*
12 KK UNDEV UNDEVELOPED BASIN
13 BA .03297
14 PB 7.8
15 PC 0.08 .09 .10 .11 .12 .133 .147 .163 .181 .204
16 PC .235 .283 .663 .735 .772 .799 .820 .835 .850 .865
17 PC .880 .890 .900 .910 .916 .925 .934 .943 .952 .958
18 PC .964 .970 .976 .982 .988 .994 1.000
19 LS 0 81 0
20 UD .15
*
*
21 KK DEVEL DEVELOPED CONDITIONS
22 BA .03297
23 PB 7.8
24 PC 0.08 .09 .10 .11 .12 .133 .147 .163 .181 .204
25 PC .235 .283 .663 .735 .772 .799 .820 .835 .850 .865
26 PC .880 .890 .900 .910 .916 .925 .934 .943 .952 .958
27 PC .964 .970 .976 .982 .988 .994 1.000
28 LS 0 93 0
29 UD .15
*
*
30 KK POND
31 RS 1 ELEV 172.07
32 SA 1.5 2.2
    
```

```

33 SE 177.07 177
34 SQ 0 3 6 9 12 15 18 21 24 27
35 SQ 30
36 SE 174.07 174.10 174.18 174.31 174.5 174.74 175.04 175.39 175.80 176.26
37 SE 176.54
+
38 ZZ
  
```

1

SCHEMATIC DIAGRAM OF STREAM NETWORK

```

INPUT LINE (V) ROUTING (--->) DIVERSION OR PUMP FLOW
NO. (.) CONNECTOR (<---) RETURN OF DIVERTED OR PUMPED FLOW

12 UNDEV
.
.
21 . DEVEL
. V
. V
30 . POND
  
```

(\*\*\*) RUNOFF ALSO COMPUTED AT THIS LOCATION

```

1*****
*
* FLOOD HYDROGRAPH PACKAGE (HEC-1) *
* MAY 1991 *
* VERSION 4.0.1E *
* Lahey F77L-EM/32 version 5.01 *
* Dodson & Associates, Inc. *
* RUN DATE 01/02/96 TIME 08:39:24 *
*****
  
```

```

*****
*
* U.S. ARMY CORPS OF ENGINEERS *
* HYDROLOGIC ENGINEERING CENTER *
* 609 SECOND STREET *
* DAVIS, CALIFORNIA 95616 *
* (916) 551-1748 *
*****
  
```

MANHATTAN ADDITION DRAINAGE PLAN  
 REQ'D POND SIZE ABOVE 35" X 24" CMAP UNDER GREENWICH  
 5-, 10-, 25-, & 100-Year Storms  
 Professional Engineering Consultants  
 Wichita, Ks  
 DRC 11/20/95  
 File: T:\DAR\HEC1\MNHATTAN.IH1

```

10 IO OUTPUT CONTROL VARIABLES
      IPRNT 3 PRINT CONTROL
      IPLOT 0 PLOT CONTROL
      QSCAL 0. HYDROGRAPH PLOT SCALE
  
```

```

IT HYDROGRAPH TIME DATA
      NMIN 6 MINUTES IN COMPUTATION INTERVAL
      IDATE 1FEB95 STARTING DATE
      ITIME 0600 STARTING TIME
      NQ 300 NUMBER OF HYDROGRAPH ORDINATES
      NDDATE 2FEB95 ENDING DATE
      NDTIME 1154 ENDING TIME
      ICENT 19 CENTURY MARK
  
```

```

      COMPUTATION INTERVAL 0.10 HOURS
      TOTAL TIME BASE 29.90 HOURS
  
```

ENGLISH UNITS

```

DRAINAGE AREA SQUARE MILES
PRECIPITATION DEPTH INCHES
LENGTH, ELEVATION FEET
FLOW CUBIC FEET PER SECOND
STORAGE VOLUME ACRE-FEET
SURFACE AREA ACRES
TEMPERATURE DEGREES FAHRENHEIT
  
```

```

JP MULTI-PLAN OPTION
      NPLAN 1 NUMBER OF PLANS
  
```

```

JR MULTI-RATIO OPTION
      RATIOS OF PRECIPITATION
      0.59 0.69 0.81 1.00
  
```



		(CFS)				
+	51.	6.00	8.	2.	2.	2.
		(INCHES)	2.170	2.638	2.638	2.638
		(AC-FT)	4.	5.	5.	5.

CUMULATIVE AREA = 0.03 SQ MI

\*\*\*                    \*\*\*                    \*\*\*                    \*\*\*                    \*\*\*

HYDROGRAPH AT STATION UNDEV  
FOR PLAN 1, RATIO = 0.69

TOTAL RAINFALL = 5.36, TOTAL LOSS = 2.05, TOTAL EXCESS = 3.31

	PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW		
			6-HR	24-HR	72-HR	29.90-HR
+	(CFS)	(HR)				
		(CFS)				
+	64.	6.00	10.	3.	2.	2.
		(INCHES)	2.722	3.308	3.308	3.308
		(AC-FT)	5.	6.	6.	6.

CUMULATIVE AREA = 0.03 SQ MI

\*\*\*                    \*\*\*                    \*\*\*                    \*\*\*                    \*\*\*

HYDROGRAPH AT STATION UNDEV  
FOR PLAN 1, RATIO = 0.81

TOTAL RAINFALL = 6.34, TOTAL LOSS = 2.14, TOTAL EXCESS = 4.19

	PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW		
			6-HR	24-HR	72-HR	29.90-HR
+	(CFS)	(HR)				
		(CFS)				
+	81.	6.00	12.	4.	3.	3.
		(INCHES)	3.448	4.193	4.193	4.193
		(AC-FT)	6.	7.	7.	7.

CUMULATIVE AREA = 0.03 SQ MI

\*\*\*                    \*\*\*                    \*\*\*                    \*\*\*                    \*\*\*

HYDROGRAPH AT STATION UNDEV  
FOR PLAN 1, RATIO = 1.00

TOTAL RAINFALL = 7.80, TOTAL LOSS = 2.25, TOTAL EXCESS = 5.55

	PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW		
			6-HR	24-HR	72-HR	29.90-HR
+	(CFS)	(HR)				
		(CFS)				
+	108.	6.00	16.	5.	4.	4.
		(INCHES)	4.563	5.554	5.554	5.554
		(AC-FT)	8.	10.	10.	10.

CUMULATIVE AREA = 0.03 SQ MI

\*\*\* \*\* \*\* \*\* \*\*

```

*****
*           *
21 KR *   DEVEL *   DEVELOPED CONDITIONS
*           *
*****
    
```

```

9 IN   TIME DATA FOR INPUT TIME SERIES
        JXMIN      30  TIME INTERVAL IN MINUTES
        JXDATE     1FEB95  STARTING DATE
        JXTIME      600  STARTING TIME
    
```

SUBBASIN RUNOFF DATA



	(CFS)	(HR)	6-HR	24-HR	72-HR	29.90-HR
+	85.	6.00	13.	4.	3.	3.
			(INCHES) 3.701	4.554	4.554	4.554
			(AC-FT) 7.	8.	8.	8.

CUMULATIVE AREA = 0.03 SQ MI

\*\*\*            \*\*\*            \*\*\*            \*\*\*            \*\*\*

HYDROGRAPH AT STATION DEVEL  
FOR PLAN 1, RATIO = 0.81

TOTAL RAINFALL = 6.34, TOTAL LOSS = 0.82, TOTAL EXCESS = 5.52

PEAK FLOW	TIME		6-HR	24-HR	72-HR	29.90-HR
+	(CFS)	(HR)				
			(CFS)			
+	103.	6.00	16.	5.	4.	4.
			(INCHES) 4.465	5.516	5.516	5.516
			(AC-FT) 8.	10.	10.	10.

CUMULATIVE AREA = 0.03 SQ MI

\*\*\*            \*\*\*            \*\*\*            \*\*\*            \*\*\*

HYDROGRAPH AT STATION DEVEL  
FOR PLAN 1, RATIO = 1.00

TOTAL RAINFALL = 7.80, TOTAL LOSS = 0.84, TOTAL EXCESS = 6.96

PEAK FLOW	TIME		6-HR	24-HR	72-HR	29.90-HR
+	(CFS)	(HR)				
			(CFS)			
+	128.	6.00	20.	6.	5.	5.
			(INCHES) 5.610	6.964	6.964	6.964
			(AC-FT) 10.	12.	12.	12.

CUMULATIVE AREA = 0.03 SQ MI

\*\*\* \*\*

\*\*\*\*\*  
\*            \*  
\*            \*  
\*            \*  
\*            \*  
\*            \*  
\*\*\*\*\*

30 KK

POND

HYDROGRAPH ROUTING DATA

31 RS

STORAGE ROUTING

NSTPS            1    NUMBER OF SUBREACHES  
ITYP            ELEV    TYPE OF INITIAL CONDITION  
RSVRIC        172.07    INITIAL CONDITION  
X            0.80    WORKING R AND D COEFFICIENT

32 SA

AREA            1.5        2.2

33 SE

ELEVATION        172.07    177.80

34 SQ

DISCHARGE        0.        3.        6.        9.        12.        15.        18.        21.        24.        27.  
                          30.

36 SE

ELEVATION        174.07    174.10    174.18    174.31    174.50    174.74    175.04    175.39    175.80    176.26  
                          176.54

\*\*\*

COMPUTED STORAGE-ELEVATION DATA

STORAGE        0.00        9.07

ELEVATION 172.07 177.00

COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

STORAGE	0.00	3.26	3.32	3.46	3.69	4.04	4.48	5.05	5.72	6.54
OUTFLOW	0.00	0.00	3.00	6.00	9.00	12.00	15.00	18.00	21.00	24.00
ELEVATION	172.07	174.07	174.10	174.18	174.31	174.50	174.74	175.04	175.39	175.80
STORAGE	7.48	8.07	9.07							
OUTFLOW	27.00	30.00	34.93							
ELEVATION	176.26	176.54	177.00							

\*\*\* \*\*\* \*\*\* \*\*\* \*\*\*

HYDROGRAPH AT STATION POND  
FOR PLAN 1, RATIO = 0.89

PEAK FLOW + (CFS)	TIME (HR)	MAXIMUM AVERAGE FLOW				
		6-HR	24-HR	72-HR	29.90-HR	
11.	6.70	5.	2.	1.	1.	
		(INCHES)	1.521	1.953	1.953	1.953
		(AC-FT)	3.	3.	3.	3.
PEAK STORAGE + (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE				
		6-HR	24-HR	72-HR	29.90-HR	
4.	6.70	3.	3.	3.	3.	
PEAK STAGE + (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE				
		6-HR	24-HR	72-HR	29.90-HR	
174.45	6.70	174.19	174.10	173.72	173.72	

CUMULATIVE AREA = 0.03 SQ MI

\*\*\* \*\*\* \*\*\* \*\*\* \*\*\*

HYDROGRAPH AT STATION POND  
FOR PLAN 1, RATIO = 0.69

PEAK FLOW + (CFS)	TIME (HR)	MAXIMUM AVERAGE FLOW				
		6-HR	24-HR	72-HR	29.90-HR	
15.	6.60	8.	2.	2.	2.	
		(INCHES)	2.184	2.698	2.698	2.698
		(AC-FT)	4.	5.	5.	5.
PEAK STORAGE + (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE				
		6-HR	24-HR	72-HR	29.90-HR	
5.	6.60	4.	3.	3.	3.	
PEAK STAGE + (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE				
		6-HR	24-HR	72-HR	29.90-HR	
174.78	6.60	174.32	174.14	173.76	173.76	

CUMULATIVE AREA = 0.03 SQ MI

\*\*\* \*\*\* \*\*\* \*\*\* \*\*\*

HYDROGRAPH AT STATION POND  
FOR PLAN 1, RATIO = 0.81

PEAK FLOW + (CFS)	TIME (HR)	MAXIMUM AVERAGE FLOW				
		6-HR	24-HR	72-HR	29.90-HR	
20.	6.60	11.	3.	3.	3.	
		(INCHES)	3.038	3.660	3.660	3.660
		(AC-FT)	5.	6.	6.	6.
PEAK STORAGE + (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE				
		6-HR	24-HR	72-HR	29.90-HR	

<del>5.</del>	<del>6.60</del>		<del>4.</del>	<del>3.</del>	<del>3.</del>	
PEAK STAGE	TIME		MAXIMUM AVERAGE STAGE			
+ (FEET)	(HR)		6-HR	24-HR	72-HR	29.90-HR
175.23	6.60		174.52	174.19	173.81	173.81

CUMULATIVE AREA = 0.03 SQ MI

\*\*\*            \*\*\*            \*\*\*            \*\*\*            \*\*\*

HYDROGRAPH AT STATION POND  
FOR PLAN 1, RATIO = 1.00

<del>PEAK FLOW</del>	<del>TIME</del>		<del>MAXIMUM AVERAGE FLOW</del>			
+ (CFS)	(HR)	(CFS)	<del>6-HR</del>	<del>24-HR</del>	<del>72-HR</del>	<del>29.90-HR</del>
+ 25.	6.60	15.	4.296	5.108	5.108	5.108
		(INCHES)	8.	9.	9.	9.
		(AC-FT)				

<del>PEAK STORAGE</del>	<del>TIME</del>		<del>MAXIMUM AVERAGE STORAGE</del>			
+ (AC-FT)	(HR)		<del>6-HR</del>	<del>24-HR</del>	<del>72-HR</del>	<del>29.90-HR</del>
+ 7.	6.60	5.	5.	4.	3.	3.

<del>PEAK STAGE</del>	<del>TIME</del>		<del>MAXIMUM AVERAGE STAGE</del>			
+ (FEET)	(HR)		<del>6-HR</del>	<del>24-HR</del>	<del>72-HR</del>	<del>29.90-HR</del>
+ 175.92	6.60	174.80	174.29	173.91	173.91	

CUMULATIVE AREA = 0.03 SQ MI

1

PEAK FLOW AND STAGE (END-OF-PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS  
FLOWS IN CUBIC FEET PER SECOND, AREA IN SQUARE MILES  
TIME TO PEAK IN HOURS

OPERATION	STATION	AREA	PLAN	RATIOS APPLIED TO PRECIPITATION			
				RATIO 1	RATIO 2	RATIO 3	RATIO 4
				0.59	0.69	0.81	1.00
HYDROGRAPH AT							
+ UNDEV	0.03	1	FLOW	51.	64.	81.	108.
			TIME	6.00	6.00	6.00	6.00
HYDROGRAPH AT							
+ DEVEL	0.03	1	FLOW	72.	85.	103.	128.
			TIME	6.00	6.00	6.00	6.00
ROUTED TO							
+ POND	0.03	1	FLOW	11.	15.	20.	25.
			TIME	6.70	6.60	6.60	6.60

\*\* PEAK STAGES IN FEET \*\*

1	STAGE	174.45	174.78	175.23	175.92
	TIME	6.70	6.60	6.60	6.60

\*\*\* NORMAL END OF HEC-1 \*\*\*

PROJECT: Manhattan Add.

STATION: \_\_\_\_\_ OF \_\_\_\_\_

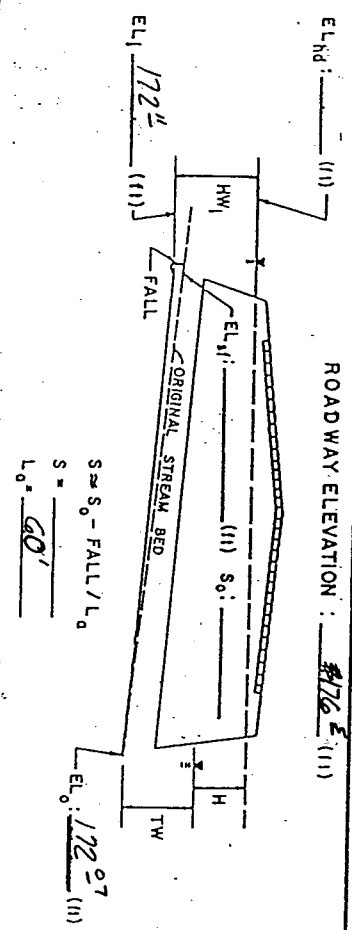
CULVERT DESIGN FORM

HYDROLOGICAL DATA

METHOD:  Rational  
 DRAINAGE AREA: 21.1 Ac STREAM SLOPE: \_\_\_\_\_  
 CHANNEL SHAPE: \_\_\_\_\_  
 ROUTING: \_\_\_\_\_ OTHER: \_\_\_\_\_

DESIGN FLOWS/TAILWATER

R.L. (YEARS) \_\_\_\_\_ FLOW (cfs) \_\_\_\_\_ TW (ft) \_\_\_\_\_  
100 128



CULVERT DESCRIPTION:  
 MATERIAL - SHAPE - SIZE - ENTRANCE

CULVERT DESCRIPTION	TOTAL FLOW (cfs)	FLOW PER BARREL (1)	INLET CONTROL			HEADWATER CALCULATIONS					CONTROL HEADWATER ELEVATION	OUTLET VELOCITY	COMMENTS	
			HW/D (2)	HW1	FALL (3)	EL h1 (4)	TW (5)	dc (6)	h0 (6)	ke (7)				H (7)
3-30" $\phi$ RCP	128	43	1.6	4.0		176"	2.2	2.35	0.5	2.2	4.55	176.55		
2-29" x 45" RCPHE	128	64	1.7	4.10		176.55"	2.15	2.28	0.5	2.2	4.48	176.55		

TECHNICAL FOOTNOTES:  
 (1) USE O/NB FOR BOX CULVERTS  
 (2) HW1/D = HW1/D OR HW1/D FROM DESIGN CHARTS  
 (3) FALL = HW1 - (ELhd - EL1); FALL IS ZERO FOR CULVERTS ON GRADE

(4) ELh1 = HW1 + EL1 (INVERT OF INLET CONTROL SECTION)  
 (5) TW BASED ON DOWN STREAM CONTROL OR FLOW DEPTH IN CHANNEL.

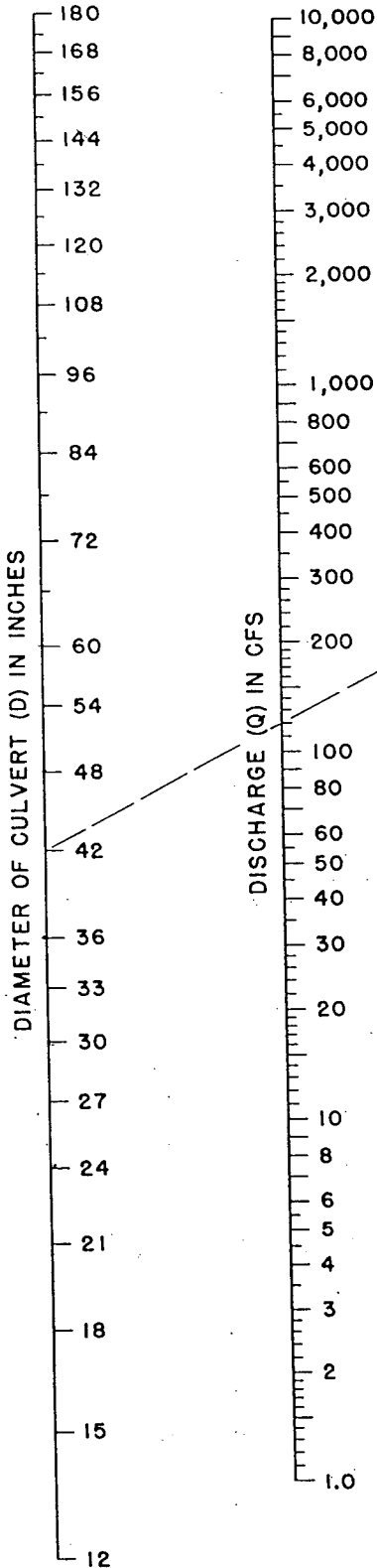
(6)  $h_0 = TW$  or  $(d_c + D/2)$  (WHICHEVER IS GREATER)  
 (7)  $H = \left[ 1 + k_e + (29n^2 L) / R L^{33} \right] V^2 / 2g$   
 (8)  $EL_{h0} = EL_0 + H + h_0$

SUBSCRIPT DEFINITIONS:  
 0. APPROXIMATE  
 1. CULVERT FACE  
 2. DESIGN HEADWATER  
 3. HEADWATER IN INLET CONTROL  
 4. HEADWATER IN OUTLET CONTROL  
 5. INLET CONTROL SECTION  
 6. OUTLET  
 7. STREAMBED AT CULVERT FACE  
 8. TAILWATER

COMMENTS / DISCUSSION:  
 3-30"  $\phi$  RCP or  
 2-29" x 45" RCPHE

CULVERT BARREL SELECTED:  
 SIZE: \_\_\_\_\_  
 SHAPE: \_\_\_\_\_  
 MATERIAL: \_\_\_\_\_  
 ENTRANCE: \_\_\_\_\_

# CHART 2



**EXAMPLE**  
 D = 42 inches (3.5 feet)  
 Q = 120 cfs

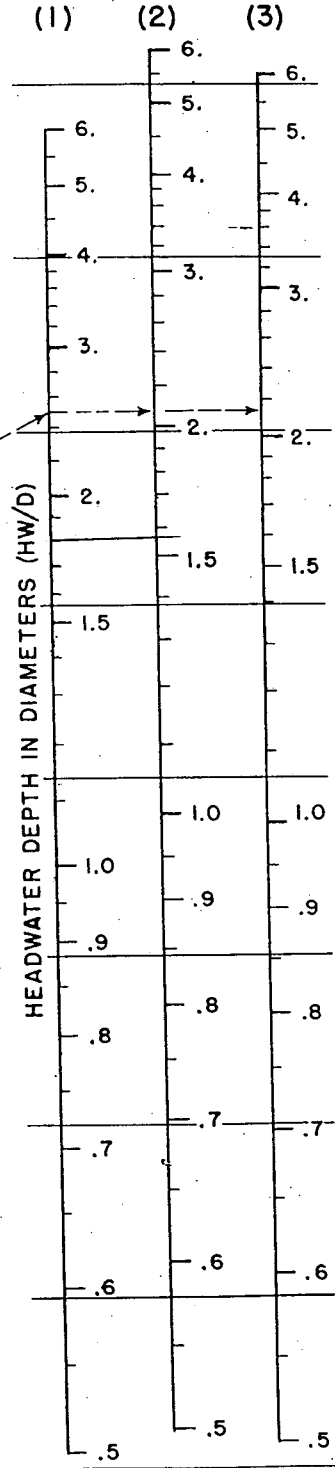
	$\frac{HW^*}{D}$	HW feet
(1)	2.5	8.8
(2)	2.1	7.4
(3)	2.2	7.7

\*D in feet

$\frac{HW}{D}$  SCALE

	ENTRANCE TYPE
(1)	Square edge with headwall
(2)	Groove end with headwall
(3)	Groove end projecting

To use scale (2) or (3) project horizontally to scale (1), then use straight inclined line through D and Q scales, or reverse as illustrated.

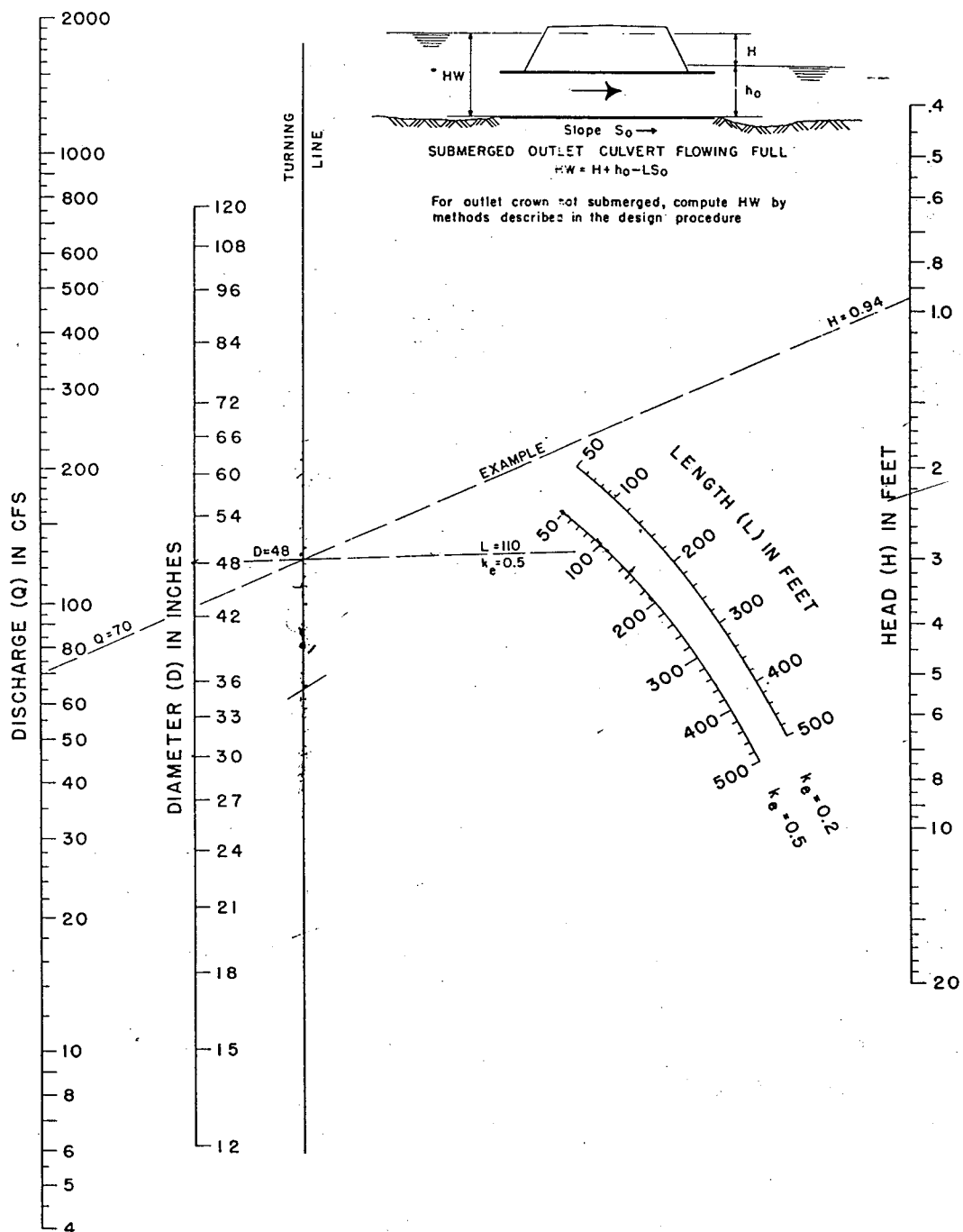


## HEADWATER DEPTH FOR CONCRETE PIPE CULVERTS WITH INLET CONTROL

HEADWATER SCALES 2&3  
 REVISED MAY 1964

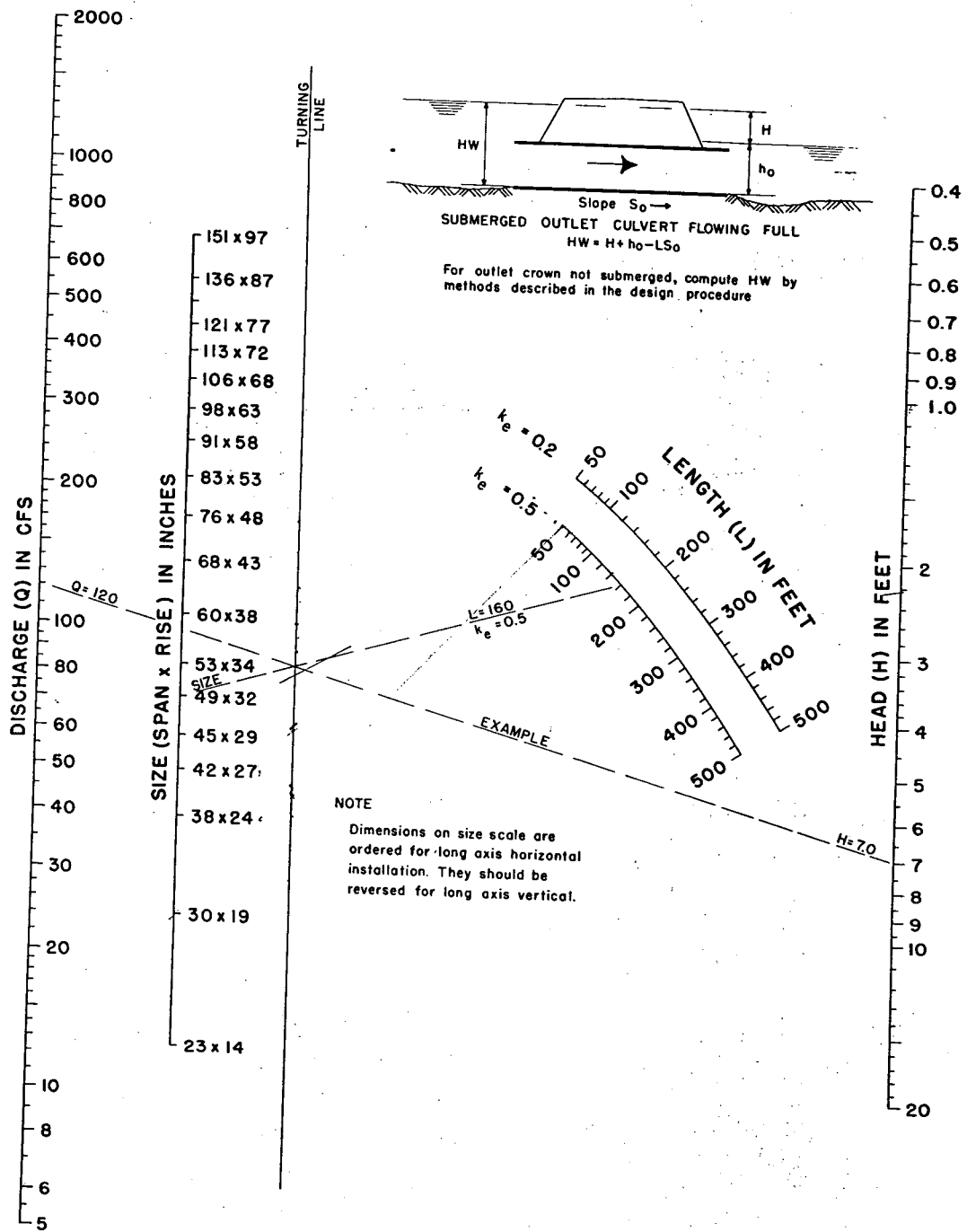
BUREAU OF PUBLIC ROADS JAN. 1963

# CHART 9



**HEAD FOR  
 CONCRETE PIPE CULVERTS  
 FLOWING FULL**  
 $n = 0.012$

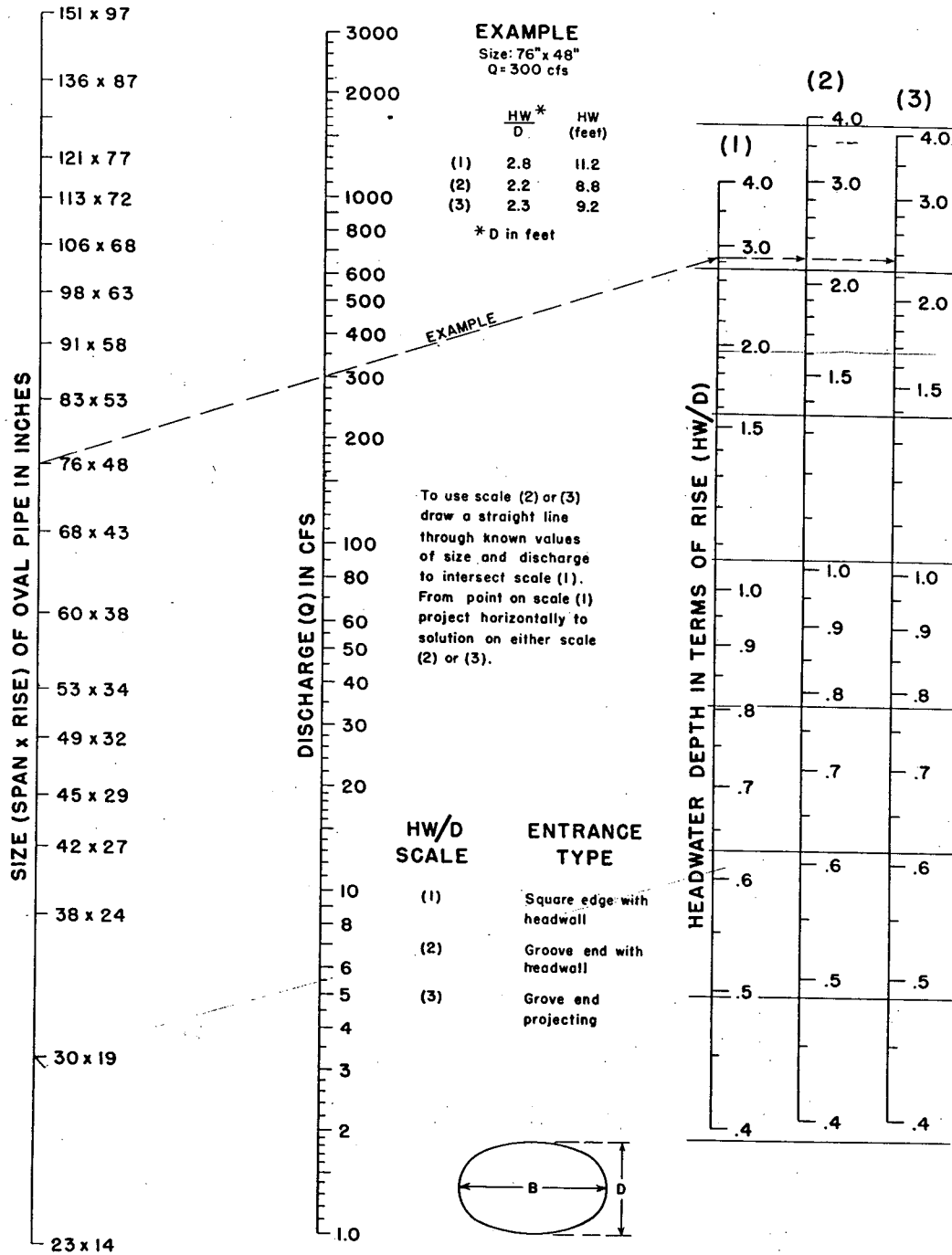
# CHART 10



## HEAD FOR OVAL CONCRETE PIPE CULVERTS LONG AXIS HORIZONTAL OR VERTICAL FLOWING FULL

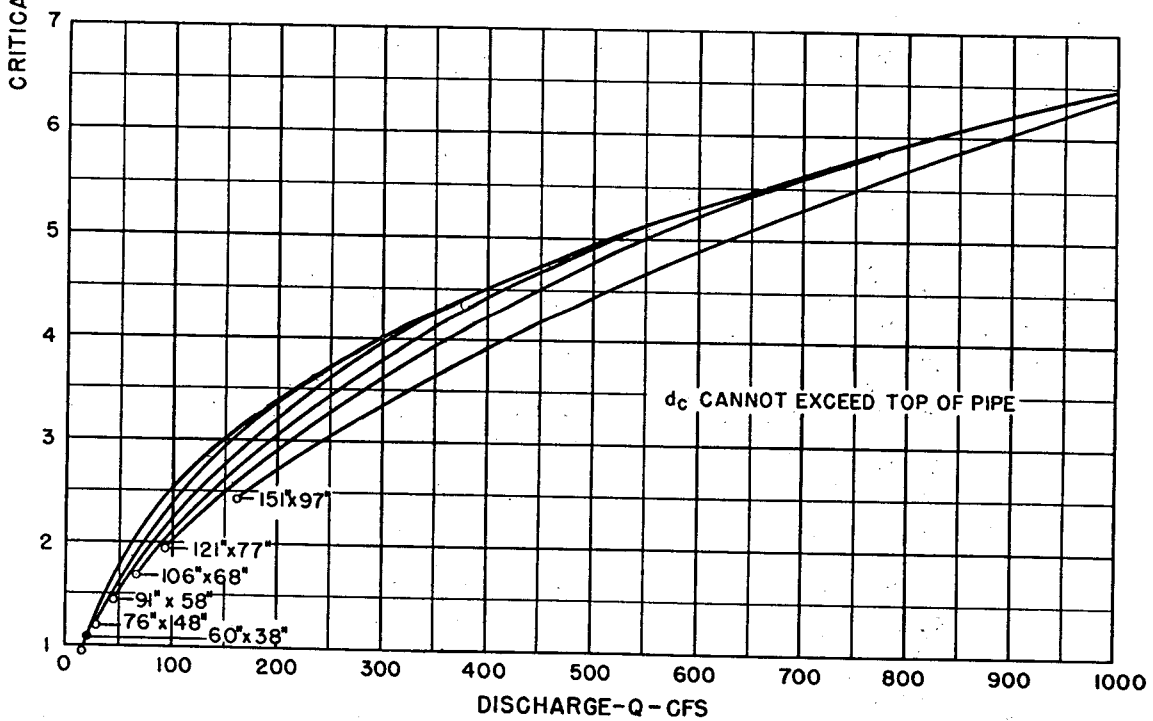
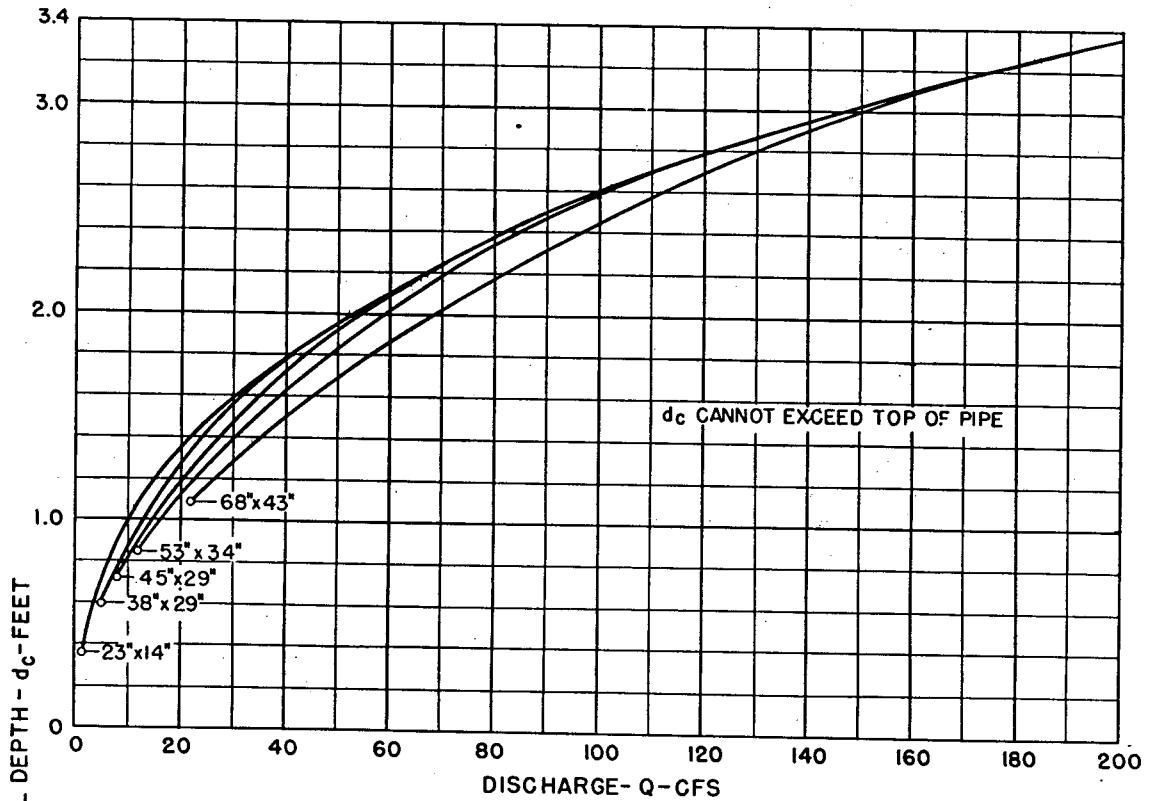
$n = 0.012$

# CHART 3



## HEADWATER DEPTH FOR OVAL CONCRETE PIPE CULVERTS LONG AXIS HORIZONTAL WITH INLET CONTROL

# CHART 17



BUREAU OF PUBLIC ROADS

JAN. 1964

**CRITICAL DEPTH  
OVAL CONCRETE PIPE  
LONG AXIS HORIZONTAL**

Table 2-2.--Runoff curve numbers for selected agricultural, suburban, and urban land use. (Antecedent moisture condition II, and  $I_a = 0.2S$ )

LAND USE DESCRIPTION	HYDROLOGIC SOIL GROUP			
	A	B	C	D
Cultivated land <sup>1/</sup> : without conservation treatment	72	81	88	91
: with conservation treatment	62	71	78	81
Pasture or range land: poor condition	68	79	86	89
good condition	39	61	74	80
Meadow: good condition	30	58	71	78
Wood or Forest land: thin stand, poor cover, no mulch	45	66	77	83
good cover <sup>2/</sup>	25	55	70	77
Open Spaces, lawns, parks, golf courses, cemeteries, etc.				
good condition: grass cover on 75% or more of the area	39	61	74	80
fair condition: grass cover on 50% to 75% of the area	49	69	79	84
Commercial and business areas (85% impervious)	89	92	94	95
Industrial districts (72% impervious).	81	88	91	93
Residential: <sup>3/</sup>				
Average lot size		Average % Impervious <sup>2/</sup>		
1/8 acre or less	65	77	85	90
1/4 acre	38	61	75	83
1/3 acre	30	57	72	81
1/2 acre	25	54	70	80
1 acre	20	51	68	79
Paved parking lots, roofs, driveways, etc. <sup>3/</sup>	98	98	98	98
Streets and roads:				
paved with curbs and storm sewers <sup>3/</sup>	98	98	98	98
gravel	76	85	89	91
dirt	72	82	87	89

<sup>1/</sup> For a more detailed description of agricultural land use curve numbers refer to National Engineering Handbook, Section 4, Hydrology, Chapter 9, Aug. 1972.

<sup>2/</sup> Good cover is protected from grazing and litter and brush cover soil.

<sup>3/</sup> Curve numbers are computed assuming the runoff from the house and driveway is directed towards the street with a minimum of roof water directed to lawns where additional infiltration could occur.

<sup>4/</sup> The remaining pervious areas (lawn) are considered to be in good pasture condition for these curve numbers.

<sup>5/</sup> In some warmer climates of the country a curve number of 95 may be used.

